STATE OF CALIFORNIA
EARL WARREN, Governor
DEPARTMENT OF NATURAL RESOURCES
WARREN T. HANNUM, Director

DIVISION OF MINES
Ferry Building, San Francisco 11
OLAF P. JENKINS, Chief

MINERAL INFORMATION SERVICE

Vol. 4 November 1, 1951 No. 11

MINERAL INFORMATION SERVICE is a monthly news release concerning the mineral resources and industry of CALIFORNIA, designed to inform the public of the discoveries, operations, markets, statistics, and new publications. It is distributed without cost upon request.

MINERAL FILLER

A mineral filler is defined as any substantially inert mineral material used primarily to modify the properties or processing of manufactured products that is not a reactive or essential component thereof. Fillers are frequently used to improve a specific property of the finished product, although they sometimes act merely as inexpensive diluents, modifying the cost.

Finely ground non-metallic minerals and rocks are often used as fillers. Almost any finely ground mineral material can be used for some filler purpose even though suitable fillers for a specific product may be limited. One of the controlling factors in the choosing of fillers is that of economy. Fine grinding is expensive, so a finely ground by-product has a distinct advantage over a substance that must be ground to order. Chemical by-product precipitates may also be used, sometimes preventing a serious disposal problem.

The different filler uses are too numerous to be listed here. However, a general classification can be made based upon the function performed by the filler:

1. Modification of optical properties, such as color, surface texture, and brightness.
2. Modification of physical properties, such as increasing viscosity or hardness, improving resistance to heat or abrasion, modifying shrinkage and minimizing cracking.
3. Modification of chemical properties such as chemical and weather resistance.
4. To fill voids in materials and in surfaces.
5. To modify such working characteristics as miscibility.
6. For such effects on other components as dilution, extension, and stability promotion.
7. Miscellaneous purposes, such as decreased costs.

The suitability of filler materials to perform these functions depends in part upon their properties. The important properties of milled mineral products which are considered for filler use are either those of the individual particles or of particle aggregates or masses. Chemical composition (which determines such properties as reactivity and solubility), specific gravity, hardness, particle shape, and color are some of the primary properties of the individual particles. Particle-size distribution, permeability, bulk density, abrasiveness, and grittiness (due to small amounts of oversize particle aggregates) are some of the secondary properties.

The demand is growing for more exacting specifications in designating filler materials. At one time there was very little or no scientific exactness in the marketing of fillers. An industry could, by trial, find that a certain filler was satisfactory and thereafter always use that material. The situation is now changing and a great many standard specifications have been set up by the American Society for Testing Materials, the Technical Association of Pulp and Paper Industry, and other industrial organizations. Many special tests within a particular industry are employed, and an increasing number of these are rather generally accepted.

Some properties are difficult to define precisely and various methods are used. For specifications on such properties, a filler-consuming industry might refer to some standard reference sample mutually agreed upon by the seller and purchaser. This empirical method is of considerable aid in maintaining uniformity.

Fineness may be easily designated by sieve or screen analyses for the grades ranging upward from 325-mesh. However for sub-sieve grades, which may